EXTERIOR ENCLOSURES

WHEN TO CONSIDER

NEEDS ASSESSMENT	NO	SCHEMATIC DESIGN	YES
MASTER PLANNING	NO	DESIGN DEVELOPMENT	YES
PROJECT STATEMENT	MAYBE	CONSTRUCTION DOCUMENTS	DONE
ARCHITECTURAL PROGRAMMING	MAYBE	CONSTRUCTION	DONE

NO-Need not consider.
MAYBE-This system may be considered.
YES-This system should be considered.
DONE-This system should have already been considered.

DESCRIPTION

The exterior enclosure of your facility serves two purposes: to keep inmates in the facility and to keep the weather out. The enclosure consists of walls, windows and roof membranes. (Windows are discussed in a separate section of the Value Matrix as they apply to interior and exterior walls.)

RELATIONSHIP TO OTHER SYSTEMS

As discussed in the structural and interior partitions sections of the Value Matrix, the exterior walls of a correctional facility often act as structural components. They may hold up the roof and intermediate floor structure of low-rise buildings. Typically, the exterior walls of a multi-story building (particularly buildings more than 40 to 50 feet high) will not act as structural elements but will be attached to the structure as an enclosure only.

ALTERNATIVES

Cast-In-Place Concrete

Because of the labor intensiveness and one-time use of forming, the use of cast-in-place concrete exterior walls is, in most cases, the most expensive and time consuming exterior wall system.

Precast Concrete

As discussed in the structural section of this Value Matrix, precast concrete can be an economically competitive exterior wall system for areas with high security and durability needs, The cost of precast members is affected greatly by the number of pieces of the some size and shape. Use of precast exterior walls for a limited number of pieces can be very expensive.

When using precast concrete, the design team should consider including in the specifications the options for the contractor to cost the panels on-site. Many general contractors do the concrete work with their own crews. This offers the contractor the option to use his own work forces and cast the panels on temporary on-site casting beds. When using this approach, take care to maintain quality control because the finish of a site-cast panel is more difficult to control than one that is plant cast.

Tilt-Up Concrete

In many respects, tilt-up concrete is similar to precast concrete, except it is less expensive. You save because it is cast at the site on the building's floor slab and simply "tilted" into place with a crane. Tilt-up concrete is very common in low-rise commercial buildings throughout the country. When using a tilt-up concrete design, your building design and construction scheduling are important in obtaining the full benefit of this method. Because the exterior walls are cast on the building floor slabs, the schedule must ensure that the floor slab is in place and provides enough area to cast the walls. Also, construction of the interior of the building (such as columns for the structure) cannot commence until the walls are cast and tilted into place. The design should include simple wall panel shapes, generally 20 to 30 feet in length and not more than 40 to 50 feet in height.

Concrete Blocks

Concrete block in correctional facilities is very common. The price is usually equal to or less than other high security systems, such as cast-in-place concrete or precast concrete. This is especially true in buildings with many different wall shapes or configurations. This system is very flexible because concrete block walls are constructed of many small pieces.

Key economic factors to consider when using concrete block walls are:

- Keep the configuration of the building as simple as possible. Every comer (particularly those that aren't 90 degrees) slows down production and, therefore, drives up labor costs. Labor cost represents a high percentage of the total cost of a masonry wall.

- Keep the number of special shapes and custom blocks to a minimum. Blocks with special ballnose comers, special shapes, special finishes or colors all cost more. When your details include these special blocks and the details are repeated over and over, the cost of a masonry wall system can increase 100 percent from typical masonry construction.

- In a secure environment the inside cores of masonry blocks typically are grouted solid. They include a lot of steel rebar reinforcing to tie the blocks together. A non-secure block wall only has rebar placed intermittently and only the areas in the wall which have rebar are grouted. It is extremely important to review the security wall plans to make sure only the areas which need to be further reinforced and grouted are so designated. If you are using masonry in areas which are not high security but need the durability of masonry, don't spend the money to fully grout the wall and add unnecessary reinforcing.

Light Gauge Metal And Wood Stud Systems

Metal or wood stud framing systems are economical and look nice in non-secure areas of the facility. A variety of exterior finish systems can be used over this framing system, such as stucco, metal panels or wood siding, When using concrete or concrete block for walls in these areas, you usually will want them finished inside with insulation and gypsum board and outside with some more aesthetically appealing finish.

Roofing

Many products on the market can be competitive, depending on haw they are specified. The two types of roofs most commonly used today are built-up roofing and single-ply membrane roofing. Consider the following cost implications when designing your roof.

- Because the market for these materials changes frequently (many are petroleum products), the roof system may be specified as more than one type of roof, allowing the contractors an option to bid on the most competitive roof material available at the time.

- If the roof is scheduled to be installed during the wet season (snow, rain or whatever applies to your area), try to limit the number of roof penetrations, complex flashings, or complex slopes. These conditions add cost and increase likelihood of roof leaks.

- Check the specifications for the thickness and type of insulation required.
- Check the specifications for the thickness of and types of materials used for flashings. Unpainted, galvanized steel is the least expensive material; painted sheet metal is the next least inexpensive. Materials like lead and copper are the most expensive.

Exterior Enclosures Matrix